

DRIVING INSTRUCTIONS

Geology 1 Field Trip – San Gabriel Mountains, Soledad Basin, San Andreas Fault

What to bring:

- Weather appropriate clothing
- Closed-toe walking shoes
- Sun glasses, sun screen, hat
- Water bottle
- Hand lens
- Clip-board or notebook, pencil
- Printout of Field Exercise and these Driving Instructions
- Sack lunch or money

ROAD LOG

START: gather at the PCC parking lot 5A at the southeast corner of the campus. Form carpool groups. Please volunteer to drive only if you have insurance and your car is in good condition and can carry passengers. The trip is about 130 miles total.

🚗 Directions: Enter the 210 Fwy westbound at Hill. Stay in the right-hand lanes. Where the 210 and 134 split stay on the 210 bearing right. Drive 16 mi and exit at Sunland Blvd. Proceed straight through the intersection at the bottom of the ramp (Fenwick) and go 0.17mi to Foothill Blvd. Turn left on Foothill. Drive 0.9 mile. Park on Foothill just before crossing the Big Tujunga bridge. There will be a golf course on your right. (Total = 19 mi)

STOP 1: Big Tujunga River

This is a major tributary of the Tujunga watershed which drains a 225 mi² area of the southwestern San Gabriel Mtns. While average annual rainfall is low, 15in/yr, it can be twice this in the higher elevations. Every few years episodes of intense rain fall, up to a record 26 inches in 24 hours, can cause "flash floods" which transport huge volumes of sediment. In 1934 heavy rains caused flooding and debris flows that killed 40 people and left 8ft boulder in the streets. Floods also occurred in 1938, 1941, 1969 and 1978. The highway was washed out just a few miles up stream in January 2005.

The low average rainfall means that the typical stream flow cannot transport the sediment present in the channel resulting in its braided character. Note other stream features like meander scarps, gravel bars, and terraces.

🚗 Directions: Continue N on Foothill 1.3mi to Wheatland, turn left then right onto the 210 Fwy west-bound. We will be driving through the area heavily shaken by the 1971 and 1994 earthquakes. After about 9mi you will make the transition to the I-5 northbound (Sacramento). Stay right and after 1 mi transition to the CA-14 toward Palmdale. Continue on CA-14 for 8.4 mi. Exit a Sand Canyon. (Total = 21 mi) Note the In-N-Out.

LUNCH: In-N-Out or sack lunch

🚗 Directions: Drive North on Sand Canyon and turn right on Soledad Canyon immediately after crossing the freeway. Proceed about 2.5mi. After crossing under the freeway park on the shoulder just past Lang Station Rd. (Total = 2.6 mi)

STOP 2: Soledad Canyon FWY Cut

Climb the hill by the freeway onramp.

- a) View North: road cut exposes angular unconformity of sandstone and conglomerates of the Mint Canyon Fm overlain by Pleistocene gravels. The right (east) end of the cut is a buttress unconformity indicating the upper layers were deposited in a channel or basin. Note that the beds exposed in the cuts for the railroad to the south match the orientation of the lower beds here.
- b) View WSW: sand and gravel works, Santa Clara River valley and 850ft suspended pipeline.
- c) View SE: Cemex Inc. - Soledad Canyon quarry. The company estimates gravel and stone production from the quarry at 56.1 million tons over the next 20 years. Sand and gravel ranks 4th in value of natural resources in California; after oil, gas, and cement (from limestone). Note the significant grading that is necessary to keep the artificial slopes stable.

🚗 Directions: Proceed E on Soledad Canyon Rd 1.9 miles to pullout. (Total = 1.9 mi)

STOP 3: Road Cut – Exercise in Crosscutting Relationships

🚗 Directions: Proceed E on Soledad Canyon Rd 1.4 mi to junction of Agua Dulce Rd. Turn left (north) on Agua Dulce Rd. Go about 4 mi. north (passing under CA-14). The road makes a 90 degree right turn and becomes Escondido Rd. At 0.9 mi. past the turn look for the sign for Vasquez Rocks County Park on the right. Turn right into the park and follow signs down the dirt road to the main parking area. (Total = 6.3 mi.)

STOP 4: Vasquez Rocks County Park.

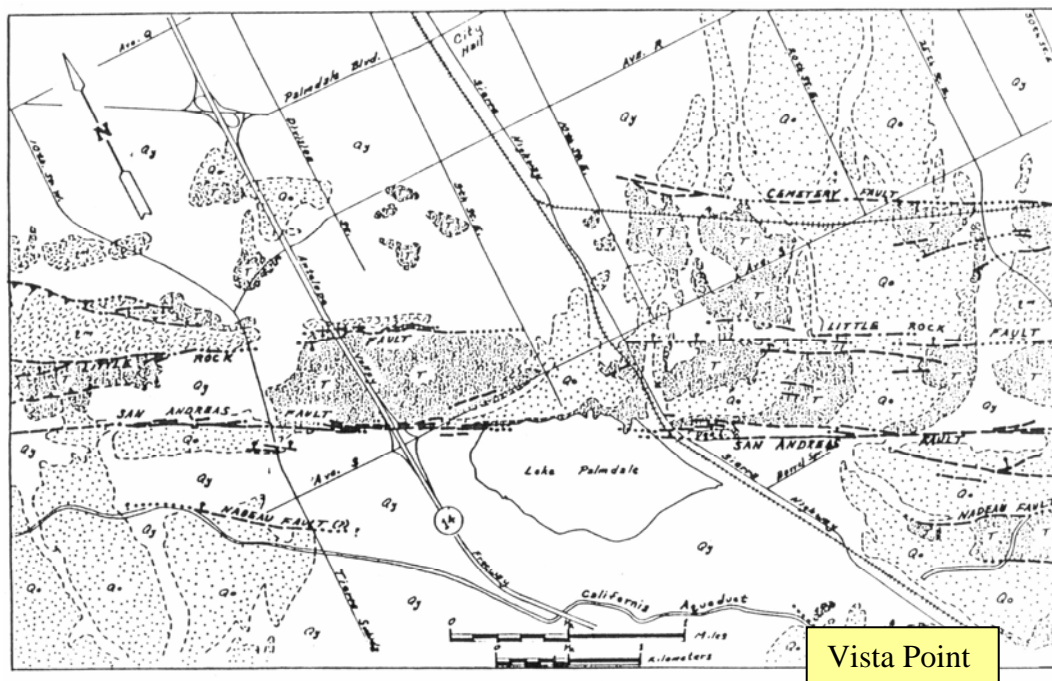
These coarsely clastic sedimentary rocks belong to the Miocene (12 –15 Ma) *Vasquez Formation* which comprises about more than 6,000 m of course-grained conglomerate sandstone, shale, and basalt, that can be found from here to Santa Barbara. The sediments were derived from sources as far away as present-day Mexico that have since been moved far way by movement along the plate boundary. The sediments were deposited on-shore in a river flood plain environment. The reddish hue is caused by the oxidation of iron. These *hogbacks* are folded and tilted up to 50 degrees over 8 to 15 Ma by deformation along the Elkhorn fault, an offshoot of the San Andreas Fault. They rise up to 50 m high and were sculpted by erosion by both water and wind.


🚗 Directions: Exit Vasquez Rocks County Park. Turn right (east) and proceed 2 mi to CA-14. Turn left onto CA-14 (toward Palmdale). Continue 14 mi on CA-14 to the Lamont Odett Vista Point. (Total = 16 mi.)

STOP 5: San Andreas Fault Zone

The Lamont Odett Vista Point is a good place to view the San Andreas fault that marks the boundary between the San Gabriel Mtns to the south (Pacific plate) and the Mojave Desert - Antelope Valley (North American plate) to the north. The Tehachapi Mountains can be seen to the NW; they are the southernmost tip of the Sierra Nevada. Several buttes (inselbergs) are visible to the N and NE.

The San Andreas fault zone is about 1 mi. wide and complex in this area. This segment of the fault slipped about 5m during the 1857 earthquake ($M=7.8$). Note the "pressure ridge" to the northwest through which the CA-14 cuts. The fault scarp defines the northern edge of Palmdale Reservoir, which was made by damming a "sag pond" in the fault. The reservoir is part of the California aqueduct system.



 Directions: Leave Lamont Odett Vista Point on northbound CA-14 and drive north through the road cut that shows intense folding in Anaverde Fm lake sediments. Exit W. Palmdale Blvd., turn left at the bottom of the ramp, go under the freeway and turn right to reentering the freeway southbound.

Return home via CA-14, I-5, and 210 Fwy.